

# Dan Hirsch

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📄 <http://github.com/thequux>

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## Computer and Programming Experience

- Experience designing application-specific microcontroller boards
- Comfortable writing and debugging Linux USB drivers and embedded firmware
- Production of user-mode and kernel-mode drivers for both Linux and my hobby OS
- Fluency in low-level programming with Assembly, C, C++, and Go
- Creation of small Linux environments for specialized purposes, such as driver testing and net booting for installs
- Database performance optimization with PostgreSQL
- Usage of Common Lisp, Perl, Python, PHP for rapid development
- Troubleshooting software issues using tracing and monitoring tools.
- Creation of distributable desktop programs using C#, Java
- Development of web applications using JavaScript, jQuery, and CherryPy
- Programming user interfaces using GTK+, CLIM
- Experience with version control using CVS, SVN, Bazaar, Mercurial, and Git
- Proficiency in programming and administrating Linux/POSIX and .NET CLR environments
- Construction of build systems using Make and GNU LD scripts

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## Employment Experience

2010–2011 **Site Reliability Engineer**, *Google, Inc.*, Mountain View, CA.

Worked with a team of eight people to run a low-latency, highly available planet-scale storage system for petabytes of data. Debugged production issues including fiber cuts, misbehaving clients, heavy resource contention, and hardware failure. Participated in weekly on-call rotation, with an SLA requiring a five-minute response time. Helped internal clients get started using our service. Led project to automate deployment of new versions of our service across dozens of clusters; reduced SRE time spent on weekly pushes by 90%. Supported Cellbots project in 20% time. Assisted with design of the “IOIO” I/O board for Android.

2009–2010 **Co-founder**, *Flippity.com*, Los Angeles, CA.

Wrote and optimized backend for Craigslist and eBay search site using Python and PostgreSQL. Wrote core of distributed scraping tool using a Java applet with a Python server component. Implemented the use of Gerrit for code reviews.

- 2009 **System Administrator**, *Law Firm of Moreno, Becerra, and Casillas*, Los Angeles, CA.  
Maintenance and operation of a network of two Windows servers serving twenty Windows clients as sole systems administrator, with responsibility for all network services, including Exchange and Active Directory. Resolved various systems issues such as Android clients being unable to fetch email; implemented Postini email filtering.
- 2008 **Systems Administration Intern**, *Google, Inc.*, Santa Monica, CA.  
Debugged workaround in kernel for NFS group count limitation using KDB. Helped develop on-disk format for the TUX3 fourth-generation Linux file system. Suggested and investigated switching to GIT for internal version-control. Debugged Kerberos/LDAP integration on Google's corporate WAN.
- 2007–2008 **Laboratory Assistant III**, *Network Research Lab, University of California*, Los Angeles, CA, Network Research Laboratory.  
Wrote kernel-mode drivers for specialized video coding hardware on a custom ST40-based board running embedded Linux for an industry-funded project seeking to develop a peer-to-peer streaming video system similar to BitTorrent.
- 2006–2007 **Intern**, *Northrop Grumman Corporation, Space & Technology Sector*, Los Angeles, CA.  
Worked on design and implementation of a reliability calculation software package for internal use. Wrote tool to allow remote dialing of Cisco VOIP telephones from Microsoft Outlook 2003. Compared derating and Digital IC/Hybrid part specifications.

## Personal Projects

- 2010–Present **Co-developer of GoodFET**.  
Implemented Atmel AVR target support. Added support for certain subfamilies of Microchip PIC24F chips. Designed and evaluated new board design based on TI Stellaris LM3S3739 microprocessor. Designed new board variant based on TI MSP430F5510 microcontroller; reduced cost by 50% and component count by 10%.
- 2007–2010 **System Administrator for UCLA Linux Users' Group**.  
Administered two servers for the UCLA LUG, with responsibility for email, web, shell, network authentication, server configuration, and administration procedures. Implemented Kerberos authentication. Initiated documentation of system design and operating procedures.
- Fall 2008 **Tutorials for UCLA CS152B – Digital Logic Design Lab**.  
Created a pair of tutorials for developing hardware systems on the Diligent XUPV2P Virtex 2 Pro evaluation board, covering interfacing custom hardware with the built-in PowerPC 405 processor cores and interfacing with the onboard AC'97 audio codec. These tutorials are currently used by the UCLA Computer Science Department as course instruction materials.
- Fall 2008 **Postscript extensions for programming use**.  
Used PostScript reflection to add several higher-order functions to the language, including function currying, composition, Factor-style `cleave`, `keep`, and `bi` operators. Also developed sample unit testing framework. Presented demo as a technical talk to the Southern California Functional Programmers group in November, 2008.

2006–2007 **Xenon OS – An Original X86 Protected-Mode Kernel.**

Developed a partial protected-mode kernel that handles basic memory management, keyboard, basic disk, and PCI bus access, and supports both Cirrus Logic CL-5446 and VMware built-in framebuffer devices to display high-resolution text and graphics. Makes limited use of APM.

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## Miscellaneous Hacks and Small-Scale Projects

- Monad tutorial for OCaml
- libusb-1.0 bindings for Go
- Testing framework for Prolog
- MSP430 BSLv2 client in Go
- Tool for plotting filesystem fragmentation
- EWMH strut support for xbat-tbar
- Generic constraint-satisfaction problem solver using C and Python with pluggable search strategies in Haskell

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## Project Team Experience

2005–2006 **Terra Engineering**, Autonomous vehicle designed and built for the 2005 DARPA Grand Challenge.

Wrote code to parse the DARPA-provided “Route Definition Data File.” Worked on obstacle tracking and mapping module and Athena sensor support. Developed various stereo vision algorithms. Fixed LIDAR issues, including incorrect documentation and driver bugs. Rewrote monitor to use GTK+ toolkit, improving flexibility. Wrote a variety of system monitoring/management and data processing scripts.

Winter 2005 **Project Grant Proposal**, Research Proposal for Microsoft’s External Research Digital Inclusion Program.

Researched feasibility and prior art for the design and implementation of a small IDE on the Pocket PC platform for submission with Dr. Massoud Ghyam.

2002–2003 **Palos Verdes Road Warriors**, Autonomous vehicle modified from SUV for 2003 DARPA Grand Challenge.

Worked with a software tool called “RVCad” to find optimal parameters and filters for preprocessing an image for input to a road-finding algorithm. Wrote test code to get the vehicle control actuators to work; this test code became a simple closed-loop speed control system. Also wrote init scripts to automatically start the custom servers. Debugged LIDAR and GPS systems.

## Education

- 2006–2009 **University of California, Los Angeles**, *B.S. in EE and CS (unfinished)*, Los Angeles, CA, Completed 143 units toward Bachelor of Science degrees in Electrical Engineering and Computer Science. Coursework included:  
**Computer Science 111** Operating System Principles  
**Computer Science 131** Programming Languages  
**Computer Science 132** Compilers  
**Computer Science 151** Computer Architecture  
**Computer Science 152B** Advanced Logic Design Lab  
**Computer Science 180** Algorithms  
**Computer Science 181** Formal Languages and Automata Theory  
**Math 113** Combinatorics  
**Math 199** Variable Topics, Algorithms
- 2005–2006 **Stanford EPGY**, Distance education offered by Stanford University for college credit.  
○ Linear Algebra  
○ Ordinary Differential Equations
- 2003–2006 **El Camino College**.  
Math/engineering coursework included:  
**Computer Science 1** Problem Solving and Program Design in C++  
**Computer Science 2** Data Structures  
**Math 210** Discrete Structures  
**Math 220** Multi-Variable Calculus
- 2002–2006 **Palos Verdes Peninsula High School**, *High School Diploma*.